REMARKS

Claims 1-22 are pending in the present Application. By this Reply, claim 19 has been cancelled. Accordingly, claims 1-18 and 20-22 are currently at issue.

I. Examiner Interview

Examiners Patel and Ward conducted a telephonic interview regarding this case on February 4, 2010, including Applicant's attorneys Joseph Berghammer and Gregory Schlenz, Applicant's representative Marc Santarini, and inventor Sylvain Henry. In the interview, the present rejections of claims 1 and 14 under §§ 112 and 103 were discussed, as well as the cited Miller and Dockus references. The Examiners agreed that the present amendments to claims 1 and 14 would overcome the rejections under § 112. Additionally, the present amendments to claims 1 and 14 were discussed with regard to the rejections under § 103. In the context of this discussion, U.S. Patent No. 3,378,914 was also discussed as a potential reference. Applicant thanks Examiners Patel and Ward for their time in conducting the interview.

II. Rejections Under 35 U.S.C. § 112

In the Office Action, claims 1-18 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. As stated above, the Examiner agreed that the present amendments to claims 1 and 14 would overcome this rejection. Thus, Applicant respectfully requests reconsideration and withdrawal of this rejection.

III. Rejections Under 35 U.S.C. § 103

In the Office Action, claims 1-6, 8-12, and 14-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,863,669 to Miller ("Miller") in view of U.S. Patent Application Publication No. 2003/0155409 to Dockus et al. ("Dockus"). Additionally, claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Miller and Dockus, in view of U.S. Patent No. 4,929,511 to Bye et al. ("Bye"). Further, claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Miller and Dockus, in view of U.S. Patent No. 6,234,377 to Teshima et al. ("Teshima"). Applicant respectfully traverses these rejections.

A. Claims 1-6, 8-12, and 21-22

Claim 1, as amended, includes, among other elements:

fluxless brazing under a controlled atmosphere consisting essentially of nitrogen and/or argon at a temperature of between 580°C and 620°C, and rapid cooling, and in which at least one of the plates consists essentially of:

(a) a core alloy … and

(b) an aluminum brazing alloy coated as a single layer on at least one face of the core alloy…

Generally, as discussed in the interview and explained in greater detail below, the cited references, alone or in combination, do not disclose fluxless controlled atmosphere brazing (CAB) without the use of a "braze promoting layer" or similar additional layer that is typically nickel, cobalt, or iron-based. In fact, the cited references teach away from performing fluxless CAB without the use of such a braze promoting layer. Claim 1 excludes an additional braze promoting layer through the use of the transition term, "consists essentially of." For this reason, no *prima facie* case of obviousness exists with respect to claim 1, as described in more detail below.

Miller is directed towards a sheet/alloy for Nocolok (with flux) or vacuum brazing, and is not designed or disclosed for use in fluxless CAB. As stated in the interview, Miller is not suitable for fluxless CAB, as shown by testing conducted by Applicant on the following brazing sheet, which meets compositions disclosed in Col. 3-4 of Miller:

	Si	Fe	Cu	Mn	Mg	Ti	Bi
Core	0.50	0.16	0.50	1.67	0.53	0.09	-
Clad	11.9	0.29	-	-	-	-	-

Brazeability was assessed in the same way described in the present Application, and this sheet was found to be completely unsuitable for fluxless CAB (brazeability rating of "E," meaning that no brazing joint at all was formed). Thus, the brazing sheets disclosed by Miller are not suitable for fluxless CAB.

Dockus does disclose brazing sheets for fluxless CAB, which include at least a core layer, a clad layer, and an additional nickel, cobalt, or iron-based braze promoting layer, along with

other optional layers. (See Par. 86 of Dockus). The disclosure of Dockus makes clear that the braze-promoting layer is critical to the performance of the sheet in fluxless CAB, and in fact, the inventor Dockus has a history of developing brazing sheets using such braze promoting layers dating back at least to 1975 (See U.S. Patents Nos. 3,970,237 and 4,028,200). These patents and the present Dockus application propose the use of a braze-promoting layer as a solution to enable fluxless CAB, to disrupt the aluminum oxide layer to permit joining of the underlying metal. (See Dockus, Par. 7). Accordingly, Dockus teaches that the disclosed brazing sheet is only suitable for fluxless controlled atmosphere brazing with the braze promoting layer. Additionally, because Dockus teaches of the criticality of the braze-promoting layer, Dockus teaches away from the use of the disclosed core and/or clad alloys in fluxless CAB without the use of the braze promoting layer.

Applicant also notes that an embodiment of Dockus, without the braze-promoting layer, was tested by Applicant as well. This sample meets the composition of one embodiment of Dockus, as the core alloy belongs to the AA-3000 series, in agreement with Dockus [0093] , and the clad alloy meets the conditions detailed in Dockus [0098]:

	Si	Fe	Cu	Mn	Mg	Ti	Bi
Core	0.16	0.15	0.64	1.33	-	0.08	-
Clad	11.6	0.31	-	-	-	-	0.15

Brazeability was assessed in the same way described in the present Application, and this sheet was also found to be completely unsuitable for fluxless CAB (brazeability rating of "E," meaning that no brazing joint at all was formed).

In view of the above, the combination of Dockus and Miller does not yield the claimed invention as recited in claim 1. Claim 1 recites fluxless brazing under a controlled atmosphere, using a plate that "consists essentially of: a core alloy … and an aluminum brazing alloy coated as a single layer on at least one face of the core alloy." The use of the transition term, "consists essentially of" excludes the use of an additional braze-promoting layer in the recited plate. The invention of a process for fluxless CAB that uses a sheet that does not contain an additional braze promoting layer or similar layer (as in claim 1) represents a significant advance in the art,

because such braze promoting layers are expensive and time-consuming to apply. (See Dockus, Par. 7).[1] The Office Action proposes combining Miller and Dockus to achieve the invention of claim 1. However, as stated above, Miller is not suitable for fluxless CAB, and Dockus teaches fluxless CAB only in connection with a Ni/Co/Fe-based braze promoting layer, and teaches away from fluxless CAB without such a braze promoting layer. Thus, if the teachings of Miller and Dockus are followed, the combination of Miller and Dockus to create a sheet for fluxless CAB would necessarily include the use of an additional braze promoting layer. The combination proposed by the Examiner, without the use of the braze promoting layer, goes against the teachings of Dockus, and would not be expected to be suitable for fluxless CAB by one skilled in the art. Accordingly, the proposed combination of Miller and Dockus do not yield the claimed invention, and cannot create a *prima facie* case of obviousness with respect to claim 1.

Claims 2-6, 8-12, and 22 depend from claim 1 and include all the elements of claim 1. Thus, for the reasons stated above with respect to claim 1, no *prima facie* case of obviousness exists with respect to claims 2-6, 8-12, and 22.

B. Claim 7

Claim 7, via dependency from claim 1, includes, among other elements:

> **fluxless brazing under a controlled atmosphere consisting essentially of nitrogen and/or argon at a temperature of between 580°C and 620°C, and rapid cooling, and in which at least one of the plates consists essentially of:**
>
> **(a) a core alloy … and**
>
> **(b) an aluminum brazing alloy coated as a single layer on at least one face of the core alloy…**

As described above with respect to claim 1, the proposed combination of Miller and Dockus does not render claim 1 obvious. The addition of Bye does not remedy the deficiencies in the rejection of claim 1. Thus, no *prima facie* case of obviousness exists with respect to claim 7.

[1] In fact, the cited Dockus application is directed toward making the production of the braze promoting layer more quick and less costly. (See Dockus, Par. 112). If eliminating this layer were obvious, Dockus would have done so.

C. Claim 13

Claim 13, via dependency from claim 1, includes, among other elements:

fluxless brazing under a controlled atmosphere consisting essentially of nitrogen and/or argon at a temperature of between 580°C and 620°C, and rapid cooling, and in which at least one of the plates consists essentially of:

(a) a core alloy … and

(b) an aluminum brazing alloy coated as a single layer on at least one face of the core alloy…

As described above with respect to claim 1, the proposed combination of Miller and Dockus does not render claim 1 obvious. The addition of Teshima does not remedy the deficiencies in the rejection of claim 1. Thus, no *prima facie* case of obviousness exists with respect to claim 13.

D. Claims 14-18

Claim 14 includes, among other elements,

subjecting the one or more plates to fluxless brazing under a controlled atmosphere consisting essentially of nitrogen and/or argon at a temperature of between 580°C and 620°C, wherein at least one of the plates subjected to fluxless brazing consists essentially of a core alloy … with the cladding alloy coated as the single layer on at least one face of the core alloy.

Like claim 1, claim 14 recites a process including fluxless brazing under a controlled atmosphere, with a sheet that excludes from its scope the use of a braze promoting layer or other similar additional layer on the brazing sheet. Thus, for the same reasons stated above with respect to claim 1, no *prima facie* case of obviousness exists with respect to claim 14.

Claims 15-18 depend from claim 14 and include all the elements of claim 14. Thus, for the same reasons stated above with respect to claim 14, no *prima facie* case of obviousness exists with respect to claims 16-18.

E. Claim 20

Claim 20 recites, among other elements,

A brazing sheet suitable for fluxless brazing under a controlled atmosphere … the brazing sheet consisting essentially of:

a core alloy … and

an aluminum brazing alloy coating at least one face of the core alloy…

As similarly stated above with respect to claim 1, the cited combination of references do not disclose, teach, or suggest a brazing sheet suitable for fluxless CAB that does not contain an additional braze promoting layer or other similar additional layer. Like claim 1, claim 20 excludes such an additional braze promoting layer from the claim scope. Accordingly, for at least the reasons discussed above with respect to claim 1, no *prima facie* case of obviousness exists with respect to claim 20.

CONCLUSION

In view of the foregoing, Applicant respectfully requests reconsideration of the Examiner's rejections and allowance of claims 1-18 and 20-22 in the present Application. Applicant submits that the Application is in condition for allowance and respectfully requests an early notice of the same.

Respectfully submitted,

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